CLAIMS

We claim:

1. A tensioner comprising:

a housing having a plunger-receiving hole, said hole having an opening;

a plunger slidably fitting into said plunger-receiving hole and protruding from the opening thereof in a protruding direction; and

a first spring biasing said plunger in said protruding direction;

toothed racks formed on opposite sides of said plunger;

a pair of wedge-shaped cams on opposite sides of said plunger, each said cam being disposed adjacent one of the respective toothed racks, each said cam having teeth lockingly engageable with teeth of the adjacent one of said racks to prevent retracting movement of the plunger relative to said cams, and each cam having an oblique surface for engagement with an oblique cam guide surface, said oblique surface of each cam facing outwardly away from said plunger, the shape of each said oblique cam surface being such that the oblique cam surface has an outer end disposed farther along said protruding direction than an inner end thereof;

a pair of oblique cam guide surfaces formed in said housing on opposite sides of said plunger, the oblique surfaces of the cams conforming to, and being in engagement with said oblique cam guide surfaces and slidable thereon to an extent such

that the teeth of the cams can be brought into and out of locking engagement with the teeth of said toothed racks;

a spacer disposed on the housing adjacent said opening; and

a second spring engaged with said spacer and said cams, said second spring urging said cams in a direction opposite to said protruding direction whereby the cams are urged into locking engagement with said toothed racks;

wherein, when the teeth of said racks have a height h, the angle between the oblique cam guide surfaces and the direction of protrusion of the plunger is θ, and the minimum backlash distance of the plunger is X, the cam guide surfaces conform to the relationship $X = h/\tan \theta$, where $15^\circ < \theta < 70^\circ$.

2. A tensioner according to claim 1, in which said plunger is rotatable in said housing, whereby the toothed racks can be engaged with, and disengaged from, the cams by rotation of the plunger.

3. A tensioner according to claim 1, in which said plunger has a front end portion, and said first spring is interposed between the front end portion of the plunger and said spacer.

4. A tensioner according to claim 3, in which said plunger is rotatable in said housing, whereby the toothed

racks can be engaged with, and disengaged from, the cams by rotation of the plunger.

5. A tensioner according to claim 3, in which said housing has a front end surrounding said opening of the plunger-receiving hole, and said spacer is pressed against said front end of the housing by said first spring.

6. A tensioner according to claim 5, in which said plunger is rotatable in said housing, whereby the toothed racks can be engaged with, and disengaged from, the cams by rotation of the plunger.